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Vowel Length in Standard Italian and Northern Italian Dialects

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Report

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In this report, the phenomenon of vowel lengthening in Standard Italian and two Northern Italian dialects, Friulian and Milanese, is discussed. For each language, the facts of vowel lengthening are presented and analyzed in the framework of several theories previously proposed to account for the data. These include primarily derivational theory, moraic theory, and optimality theory. Vowel lengthening is analyzed predominantly from a synchronic perspective for Standard Italian, but for Friulian and Milanese, both diachronic and synchronic accounts are presented.

Vowel length in Italian and Milanese is seen to result from bimoraic enforcement, a principle requiring that all stressed syllables be bimoraic. A constraint prohibiting long vowels in word-final position interacts with the principle of bimoraic enforcement in Italian. In Milanese, bimoraic enforcement responds to a lexical contrast in moraic and non-moraic codas. Vowels before non-moraic codas lengthen to create a bimoraic syllable, while those before moraic codas do not since those syllables are already bimoraic. In Friulian, on the other hand, historical vowel lengthening which resulted from compensatory lengthening following the apocope of final vowels has been reanalyzed as a synchronic process of compensatory lengthening resulting from loss of consonant voice following word-final devoicing.

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0. Introduction

The representation and analysis of long vowels in Italian and the Italian dialects has long been a source of controversy. There is disagreement over why vowels lengthen, how they lengthen, and for some, whether the vowel lengthening that occurs is significant enough to be analyzed as a phonological process or whether it is simply a low-level phonetic process. Vowel length often interacts with consonant length and stress, particularly in Standard Italian. Phonologists have looked at how to account for and represent vowel length in a variety of theories and models, including moraic theory and optimality theory (OT).

In this report, I will look at vowel lengthening in Standard Italian and two Northern Italian dialects – Friulian and Milanese – and I will examine different analyses that have been proposed to account for long vowels in each language. I will look at what similarities and what differences exist in the motivation for vowel lengthening in the three languages and explore how they are significant in terms of classifying these languages within Romance. For each language, I will examine the structure of syllables, as well as the relationship between stress and weight, crucial in understanding the process of vowel lengthening.

In the first chapter of this report, I will explore vowel lengthening in Standard Italian. In chapters two and three, I will analyze data on vowel lengthening from Friulian and Milanese respectively. This report aims to present a unified account of vowel lengthening in the three languages discussed.

1. Italian

1.1 Distribution of long vowels

In Italian, long vowels occur only under stress. Stressed vowels are always long in non-final open syllables but short in closed syllables and in word-final open syllables (Hajek 2000: 111). Unstressed vowels are always short. It is important to note that vowel length is not distinctive in Italian – unlike in Friulian and Milanese, there are no true minimal pairs contrasting a short and long vowel. For example, in ['fa:to] *fato* 'fate' and ['fatto] *fatto* 'fact', there is a contrast between the length of both the vowel [a] and the consonant [t]. Consonant length is typically assumed to be distinctive rather than vowel length (Chierchia 1986: 6).

1.2 Representing vowel length

Capturing the relationship between vowel length, consonant length, and stress is crucial to any phonological analysis of Italian. In this section, we will look at several different analyses accounting for vowel length in the language.

1.2.1 Traditional analyses

Saltarelli (1984: 280) notes the significance of the relationship between the length of a stressed vowel and that of the following consonant, the so-called "metric syllable". In Latin, a stressed vowel could be short or long and could be followed by a short or geminate consonant, resulting in the following four possible sequences: V́:C:, V́C, V́:C, V́C: (Saltarelli 1984: 284). In Italian, the first two types have been eliminated, leaving

only the possibility of a long stressed vowel followed by a short consonant or a short stressed vowel followed by a geminate consonant (Saltarelli 1984: 284). This leads to the creation of a "'duration rhythm', a proportional difference in length between a stressed vowel and the following consonantal segment" (Saltarelli 1970: 27). Given this relationship, one may assume that it is not necessary to mark both consonant length and vowel length lexically – one of the two should be predictable from rules in the grammar.

There are two possible analyses of vowel length according to Saltarelli (1984: 279). One, which he calls the Stress Hypothesis claims that stress and consonant length are distinctive features in Italian, while vowel length is predictable by rule. The second, the Vowel Length Hypothesis, instead proposes that vowel length is a distinctive feature and that consonant length and stress are predictable by rule. Following the Stress Hypothesis, underlying representations of ['fa:to] and ['fatto] would be /'fato/ and /'fatto/ respectively, with stress and consonant length marked. Application of a rule predicting vowel lengthening in word-medial open stressed syllables would obtain the observed surface forms, ['fa:to] and ['fatto]. While this analysis accounts for vowel lengthening, it fails to explain why vowel lengthening occurs in this context. It also requires lexical marking of both stress and consonant length.

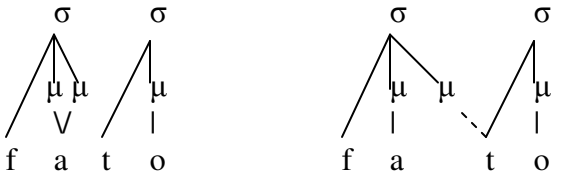
Under the Vowel Length Hypothesis, underlying forms for *fato* and *fatto* would be /fa:to/ and /fato/. Saltarelli (1970: 29) proposes a stress rule followed by the 'duration rhythm' rule to obtain the surface forms. The stress rule assigns stress to the antepenultimate syllable if the penultimate is light (i.e. short vowel in an open syllable), otherwise the penultimate is assigned stress (Saltarelli 1970: 29). The 'duration rhythm'

rule creates long consonants from single consonant segments that are preceded by a short stressed vowel and followed by a vocalic segment (Saltarelli 1970: 29). Following application of these rules, we obtain ['fa:to] and ['fatto]. Saltarelli (1970: 30) claims that the Vowel Length Hypothesis is more desirable than the Stress Hypothesis since it is more economical – only vowel length is marked lexically. However, the stress assignment rule is problematic. It does not account for words that are stressed on the final syllable, such as *città* 'city'. These words would have to be marked lexically for stress or more complex stress assignment rules must be posited. Saltarelli (1970: 81) later posits a series of several cyclic rules to account for primary stress. This approach is extremely convoluted and misses some important generalizations about Italian phonology.

1.2.2 Moraic analysis and the bimoraic norm

A moraic analysis of the Italian data offers further insight into the relationship between vowel length, consonant length, and stress. In moraic theory, long vowels are associated with two moras while short vowels license a single mora. Geminates are assigned a mora underlyingly and are linked to both the coda of the preceding syllable (where they contribute their mora) and the onset of the following syllable. The representation of *fato* and *fatto* would be as follows:

(1)



Looking at these two structures, an important similarity between them becomes clear. The stressed syllable (the first syllable) in each contains two moras. Repetti (1989: 14)

states that all stressed syllables in Italian are bimoraic. According to the so-called bimoraic norm, active in Italian and in several Italian dialects, heavy syllables are equivalent to two moras, and light syllables (V) are equivalent to one mora (Hajek 2000: 111). Non-final stressed syllables are always heavy (bimoraic) (Hajek 2000: 111). This captures nicely the generalizations seen in the previous section where we saw that long stressed vowels cannot be followed by geminate consonants (which would create trimoraic structures – two moras from the vowel and a mora from the geminate consonant) and that short stressed vowels cannot be followed by single consonants (which would create a monomoraic stressed syllable, since the consonant would be in the onset of the next syllable, unable to license a mora).

Word-final stressed syllables are an apparent exception to the bimoraic norm. As we saw in section 1.1, these stressed vowels are always short, i.e. monomoraic. It would be possible to posit a process whereby the second mora of the stressed vowel is removed due to a prohibition against long vowels in final position in Italian. This, however, would invalidate the bimoraic norm in the case of these tonic syllables. An alternative explanation is presented by Basbøll (1989:21-22). He claims that the second mora of the stressed final vowel is not removed, but that it is simply not realized due to a rule specifying that all final vowels are short. The result is a "floating" mora (Repetti 1989: 56). This mora lacks a surface manifestation, but it can be realized if certain phonological and syntactic conditions are met (Repetti 1989: 47). One such case is *raddoppiamento sintattico*, which we will analyze in the following section.

Given that tonic syllables in Italian must be bimoraic, it is possible to account for vowel lengthening in open stressed syllables without marking it lexically. Consonant length and stress would be marked underlyingly and vowel length predictable on the basis of a principle of bimoraic enforcement. Since stressed word-medial syllables must be bimoraic, a short stressed vowel in an open syllable must lengthen. Looking once again at the near-minimal pair *fato* and *fatto*, underlying representations would be /'fato/ and /'fat$_{\mu}$o/, with stress and consonant length marked. The vowel in /'fato/ will lengthen to create a bimoraic stressed syllable, while there is no need for lengthening in /'fat$_{\mu}$o/, where the stressed syllable already contains two moras. The surface forms ['fa:to] and ['fatto] are thus obtained. Note that there are several similarities between this analysis and the Stress Hypothesis analysis in section 1.2.1. In both analyses, consonant length and stress are marked underlyingly. However, the moraic analysis provides a more principled account of vowel lengthening, justifying it in terms of bimoraic enforcement.

1.3 *Raddoppiamento sintattico*

Oxytones and certain monosyllables ending in a vowel trigger gemination of the initial consonant of the following word – this phenomenon is known as *raddoppiamento sintattico* (Repetti 1989: 48). Chierchia (1986: 6-8) names three types of *raddoppiamento*. They are given below in (2):

(2) a. Rhythmic (phonological) *raddoppiamento* – In a sequence of two words, the initial consonant of the second word is lengthened when the first word ends in a final stressed vowel. Ex. *città triste* 'sad city' [tʃitˈta] + ['triste] → [tʃitˈta*t*'triste]

b. Backwards *raddoppiamento* – In a sequence of two words, the final consonant of the first word is lengthened if that word is stressed on the final syllable and

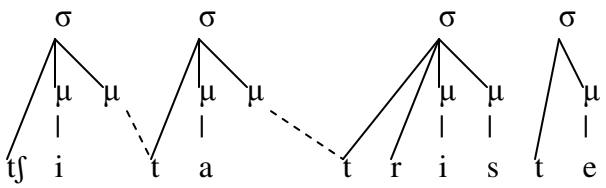
the second word begins with a vowel. Ex. *tram elettrico* 'electric bus' ['tram] + [e'lettriko] → ['tra*mm*e'lettriko]

c. Morphological *raddoppiamento* – In a sequence of two words, the initial consonant of the second word is lengthened if the first word belongs to a list of words triggering this process (see (5)). Ex. *Maria o Carla* 'Maria or Carla' [ma'ria] + [o] + ['karla] → [ma'ria o*k'k*arla]

1.3.1 Phonological *raddoppiamento*

In phonological *raddoppiamento*, the gemination of the initial consonant of the second word closes the preceding stressed syllable. Where there was once a short vowel, there is now a short vowel plus the first half of a geminate consonant. Geminates license a mora, thus the stressed syllable is clearly bimoraic now, with both moras having a surface manifestation. Following our analysis in the previous section of stressed word-final vowels, we can say that the "floating" mora of the final vowel in the first word has been filled by the geminate. Schematically, the representation of *città triste* would be as in (3).

(3)



The facts of *raddoppiamento* in this context provide evidence for the validity of the bimoraic norm. Chierchia (1986: 8) uses what he calls the "*strong rime condition*", which requires that all stressed syllables in non-prepausal position be heavy, to account for the pattern observed here. He points out that "while word internally vowel length and consonant length appear both possible ways of meeting well-formedness (i.e. of rendering heavy stressed syllables), only consonant length appears to be possible at word

boundaries" (Chierchia 1986: 9). In cases of lengthening between words, it is always the consonant, not the vowel that lengthens.

Not all linguists agree with Chierchia's analysis. Absalom, Stevens, and Hajek (2002: 7) assert that "optional left to right final vowel lengthening is indeed possible and has long been reported to block potential RS [*raddoppiamento sintattico*]". For example, in *andò bene* 'it went well', we would have [anˈdoːˈbɛːne] (Absalom et al. 2002: 7). However, this observation does not invalidate the notion of a desire to have bimoraic stressed syllables in Italian. On the contrary, it provides further evidence for the principle of bimoraic enforcement, showing that the second mora of a final stressed syllable, which is prohibited from being realized in absolute final position, can be realized either by gemination of a following consonant or by lengthening of the vowel inside a sequence of words.

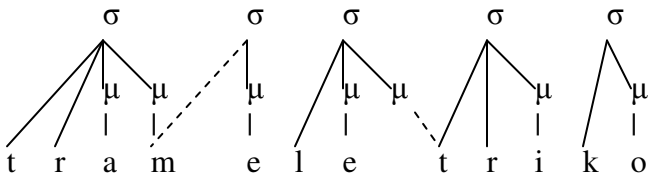
The notion of an empty "floating" mora that is realized following application of *raddoppiamento* is rather abstract. This is one possible critique of the analysis presented here. However, positing this abstract mora has the benefit of allowing us to account for the phenomenon of phonological (rhythmic) *raddoppiamento*.

1.3.2 Backwards *raddoppiamento*

In the case of backwards *raddoppiamento*, the data are slightly different, but they can be accounted for in terms of the same kind of explanation as the lengthening we just examined. In backwards *raddoppiamento*, it is the final consonant of the first word that is lengthened. It is clear, however, that lengthening occurs here to maintain bimoraicity of the stressed syllable as well. Before a vowel initial word in Romance, the final consonant

of the previous word is typically resyllabified into onset position before the following vowel. For example, in French we have *Georges et moi* 'George and I': [ʒɔrʒ] + [e] + [mwa] → [ʒɔr.ʒe.mwa]. In a language such as French with many word-final consonants, resyllabification at word boundaries is quite frequent. In Italian, a language with few word-final consonants, this phenomenon has a rather limited role and appears to be subject to some higher ranking constraints. Recall that in Italian, coda consonants are moraic. If resyllabification of a final consonant occurs, the mora previously licensed by the coda is left empty. There seems to be a strong desire to preserve this mora, and backwards *raddoppiamento* serves to do just that by geminating the consonant.

(4)



Interestingly, if a final consonant is not the only member of a coda, it can be resyllabified. This is because resyllabification does not result in the loss of a mora in this case. For example, in *sport agonistico* 'sports training', the [r] of *sport* remains in the coda, associated with a mora, as [t] is resyllabified as the onset of [an]. The resulting pronunciation is [spɔr.ta.go.nis.ti.ko].

1.3.3 Morphological *raddoppiamento*

The third case of *raddoppiamento* warrants a slightly different treatment. Morphological *raddoppiamento* still serves to fill an empty mora lacking a surface representation, but the source of this empty mora can be found in diachronic rather than

synchronic processes. A sampling of monosyllables that trigger morphological *raddoppiamento* is given below in (5) from Repetti (1989: 50):

(5)	*a*	'at, to'	*ma*	'but'
	che	'that, what'	*qua*	'here'
	chi	'who'	*più*	'more'
	da	'from'	*sì*	'yes'
	e	'and'	*tra*	'between'
	là	'there'	*o*	'or'

Several of these monosyllables are derived from Latin words that had a final consonant. Among those are *a* < *ad*, *sì* < *sec*, and *e* < *et* (Repetti 1989: 53). These consonants would have had a mora associated to them since they were in coda position. Other monosyllables in (5) were not followed by a consonant in Latin, but did have a long (i.e. bimoraic) final vowel, for example *chi* < *quī* (Repetti 1989: 53). "If we assume that this second mora was not lost underlyingly, despite the loss of the syllable final consonant or of the length of the vowel, then the process of *raddoppiamento sintattico* may be accounted for … as a moraic conservation rule" (Repetti 1989: 56). In these cases then, the mora of the coda consonant or the second mora of the vowel was preserved as a "floating" mora. *Raddoppiamento* fills this mora, giving it a surface representation.

1.4 A three-way contrast in vowel length?

Until now, we have looked at Italian syllables as being maximally bimoraic, and in the case of stressed syllables, obligatorily bimoraic. Hajek (2000), however, challenges the idea of maximally bimoraic syllables in Italian, proposing instead the possibility of trimoraic syllables. He claims that the traditional analysis of vowel length as a binary distinction between long vs. short vowels is inadequate (Hajek 2000: 114-115). He

instead cites evidence for a three-way vowel length contrast between monomoraic (short), bimoraic (long), and trimoraic (overlong) vowels. One piece of evidence for a distinction between long and overlong vowels is found in diphthongization patterns of stressed vowels. Historically, the low mid vowels [ɛ] and [ɔ] diphthongized in stressed open syllables (Maiden 1995: 35). However, Hajek (2000: 115) notes a difference in diphthongization of vowels in different positions:

> Expected diphthongization of 'long' vowels in antepenultimate position is much less regular, with a strong historical tendency towards failure to diphthongize or to secondary elimination of earlier diphthongized forms in this context, [ˈpɛ:kora] 'sheep', and [ˈpɔ:polo] for earlier [ˈpwɔ:polo] 'people'. These data are strongly suggestive that the traditional view of vowel length distribution in Standard Italian needs revision.

There is also evidence from experimental studies on vowel length to suggest a three-way vowel length distribution. Hajek (2000: 115) looks at stressed vowel duration in ultimate, penultimate, and antepenultimate position in five phonetic studies. Stressed vowels in penultimate position were found to be consistently longer than those in antepenultimate position, while stressed vowels in word-final position were the shortest. For example, Bertinetto (1981: 254) found the following vowel lengths:

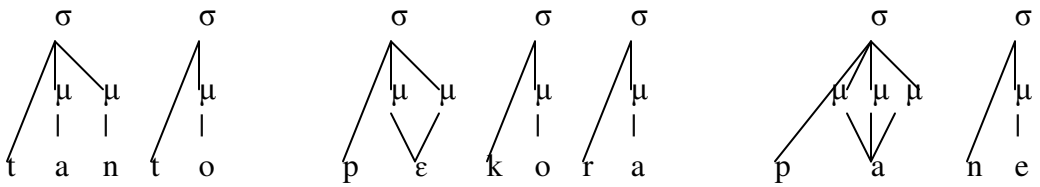
(6)

word-final 'V	139 ms
penultimate 'V	157 ms
antepenultimate 'V	174 ms

These data suggest a hierarchy of vowel length, with final stressed vowels being the shortest, penultimate stressed vowels the longest, and antepenultimate stressed vowels 'half-long'.

If we assume a three-way length contrast for vowels, the next question is how to account for and represent those length differences. Hajek (2000: 116) proposes to continue using moras to represent vowel length. However, instead of having maximally bimoraic syllables, Italian would have syllables containing up to three moras. Short vowels are monomoraic, stressed vowels in antepenultimate position are bimoraic, and stressed vowels in penultimate position (the "overlong" vowels) are trimoraic (Hajek 2000: 116). So for the three words *tanto* 'so (much/many)', *pecora* 'sheep', and *pane* 'bread', we would have the following moraic structures (Hajek 2000: 117):

(7)



The analysis of stressed penultimate vowels as trimoraic seems to have phonetic support, but accepting this analysis forces us to reject the bimoraic norm and our previous account of vowel lengthening in Italian. Under the three-way length analysis, there is no longer a clear justification for vowel lengthening. Assuming all vowels license one mora underlyingly, why do vowels in some positions acquire two moras, and others just one? Also, it is not clear what type of syllable is optimal – there is no 'trimoraic norm', so what motivates the insertion of two moras to a stressed penultimate vowel? These are questions that remain to be answered. The OT analysis in the next section will be based

on the analysis in 1.2.2 which assumes that vowels in Italian are maximally bimoraic. This analysis accounts better for vowel lengthening and its relation to consonant length and stress.

1.5 OT Analysis

In this section, I will analyze the Italian data using OT (Prince and Smolensky 2004)[1]. Following the analysis presented in section 1.2.2 and section 1.3, we will mark consonant length and stress in the input, and vowel length will be predicted by the grammar. The following are relevant constraints to account for vowel lengthening:

(8) STW = if stressed, then heavy (bimoraic)
DEP-μ-V = output moras on vowels must have input correspondents
DEP-μ-C = output moras on consonants must have input correspondents
MAX-μ = each mora of input must have a correspondent in the output
*V:]$_w$ = no long vowels in word-final position
*3μ = no trimoraic syllables

A mora must be added to a vowel in some cases to make a stressed syllable bimoraic, so we know that STW must crucially dominate the DEP constraints. We also know that *V:]$_w$ crucially dominates STW as vowels in absolute word-final position are never permitted to surface as long. The ranking of the constraints in (8) that will correctly predict vowel lengthening is presented in (9).

(9) *V:]$_w$, MAX-μ >> STW, *3μ >> DEP-μ-C >> DEP-μ-V

The tableaux for ['fatto] *fatto*, ['fa:to] *fato*, and [tʃit'ta] *città* are shown below.

[1] The OT analysis presented here is my original analysis. For alternative OT analyses of Italian vowel length, see D'Imperio and Rosenthall (1999) and Nagy and Napoli (1996).

(10) Tableau for *fatto*

	/'fat$_{\mu}$o/	*V:]$_{w}$	MAX-μ	STW	*3μ	DEP-μ-C	DEP-μ-V
a.	'fa:tto				*!		*
☞b.	'fatto						
c.	'fa:to		*				*
d.	'fato			*!			

(11) Tableau for *fato*

	/'fato/	*V:]$_{w}$	MAX-μ	STW	*3μ	DEP-μ-C	DEP-μ-V
a.	'fa:tto				*!		*
b.	'fatto					*	
☞c.	'fa:to						*
d.	'fato			*!			

(12) Tableau for *città*

	/tʃi't$_{\mu}$a/	*V:]$_{w}$	MAX-μ	STW	*3μ	DEP-μ-C	DEP-μ-V
a.	tʃit'ta:	*!					*
☞b.	tʃit'ta			*			
c.	tʃi'ta:	*!	*				*
d.	tʃi'ta		*!	*			

The OT analysis presented here accounts for vowel lengthening in open stressed syllables in non-final position. The crucial ranking of STW over DEP-μ-V permits vowels to lengthen in this context, while MAX-μ prevents lengthening before a geminate consonant and *V:]$_{w}$ prevents lengthening word-finally. The constraint ranking presented here also accounts for the facts of phonological *raddoppiamento*[2]. The appearance of bimoraic stressed syllables is conditioned by the high ranking of STW. At word boundaries, the crucial ranking of *V:]$_{w}$ and MAX-μ over DEP-μ-C favors realization of the

[2] For alternative analyses of *raddoppiamento* in OT, see Absalom and Hajek (1997) and Borrelli (2002).

second mora of a stressed word-final vowel by the following consonant rather than the vowel.

In the case of morphological *raddoppiamento*, unstressed monosyllables, such as *da*, trigger *raddoppiamento*. As we saw in section 1.3.3, the second mora of the final vowels in these monosyllables results not from the desire to satisfy bimoraicity constraints, but rather from preservation of a historical mora. Thus, these words must be marked as bimoraic in the input, as STW will not condition the addition of a mora to these unstressed items.

To account for the facts of backwards *raddoppiamento*, it is necessary to introduce one additional constraint. As we saw in section 1.3.2, backwards *raddoppiamento* does not occur before vowel-initial words when the final syllable of the previous word contains two coda consonants (for example in *sport agonistico*). Instead, typical Romance resyllabification is realized. The constraint needed to capture the desire to resyllabify word-final consonants as onsets before following vowel-initial words in this case is ONSET, paraphrased in (13):

(13) ONSET = every syllable has an onset

This constraint would be crucially ranked below MAX-μ, since resyllabification at word boundaries only occurs in Italian if no mora loss occurs. This ranking would predict outputs such as *tram elettrico*, where the final consonant is geminated to preserve the mora associated with [m].

Given the data presented here, it is clear that *raddoppiamento* (particularly phonological and morphological *raddoppiamento*) can be accounted for in OT using the

same constraints as those needed to account for vowel lengthening in stressed syllables. There is no need to re-rank constraints, only the need to mark unstressed *raddoppiamento* triggers as underlyingly bimoraic. This allows us to propose a unified account of weight in Italian.

2. Friulian

2.1 Distribution of long vowels (Baroni and Vanelli 2000: 14-15)

In Friulian, long vowels can only occur in stressed word-final syllables closed by a single consonant[3]. Vowels are short when they are not in the final syllable of a word, when they are in a final syllable closed by a consonant cluster, and when they occur in a final open syllable. Even in word-final stressed syllables, vowels are always short when followed by affricates or nasals. Stressed vowels are always long, however, when they are followed by [r]. Before [l], both long and short stressed vowels can occur.

2.2 Vowel length and final devoicing

There is a process of final devoicing in Friulian, by which all word-final obstruents come to be voiceless. This renders vowel length distinctive in word-final syllables closed by single obstruents (Baroni and Vanelli 2000: 15). Minimal pairs such as those below in (14) occur in the language[4]:

(14)	['la:t]	'gone (m.)'	['bru:t]	'broth, mother-in-law'	['lu:s]	'light'
	['lat]	'milk'	['brut]	'ugly (m.)'	['lus]	'luxury'

Looking at derived forms of these words, where the sequence occurs word-internally, provides further insight into the observed contrast between long and short vowels.

(15)	['la:t] / ['lade]	'gone (m.) / (f.)'	['lat] / [la'ta]	'milk / to breastfeed'
	['brut] / ['brute]	'ugly (m.) / (f.)'		
	['lu:s] / [lu'zo:r]	'light / diffuse light'		

[3]There are a few exceptions to this generalization. Long vowels may occur in an open stressed final syllable in infinitives for example: [klama:] 'to call' (Hualde 1990: 33).
[4] All examples in (14) and (15) are from Baroni and Vanelli (2000: 16-17).

Where a morpheme has a long vowel followed by a voiceless obstruent in a word-final stressed syllable, it has a short vowel followed by a voiced obstruent in word-internal position. On the other hand, a morpheme with a short vowel followed by a voiceless obstruent in a word-final stressed syllable also has a short vowel followed by a voiceless obstruent word-internally. It seems then, that there is a relationship between the voice of the obstruent and the length of the preceding vowel.

2.3 Derivational analysis

There have been several different analyses of the Friulian data. We will begin by looking at a derivational analysis by Baroni and Vanelli (2000: 27). Based on the observations in section 2.2, two rules can be posited to account for the data – vowel lengthening before voiced consonants and final devoicing.

(16) Rules:

1. Vowel lengthening $V \rightarrow V: \; / \; \underset{\substack{[+\text{ voice}]\\[-\text{son}]}}{\_\_ \; C \; \#\#}$

2. Final devoicing $\underset{[-\text{son}]}{C} \rightarrow [-\text{voice}] \; / \; \_\_ \; \#\#$

(17) Examples:

Underlying representation	/lad/	/lad+e/	/lat/	/lat+a/
Vowel lengthening	/la:d/	----	----	----
Final devoicing	/la:t/	----	----	----
Surface form	[la:t]	[lade]	[lat]	[lata]

It is important to note that vowel lengthening must apply before final devoicing in order to predict the correct surface form. If the order of the rules were reversed, final devoicing would bleed vowel lengthening – we are thus looking at a case of

counterbleeding. Vowel lengthening applies, but there is no apparent context for its application.

The derivational analysis captures well the relationship between consonant voice and vowel length. According to Hualde (1990: 34), the surface vowel-length contrast in forms such as ['lat] 'milk' and ['la:t] 'gone (m.)' corresponds to an underlying voice contrast. The derivational analysis portrays precisely this – in the underlying forms, there is a contrast between voiceless /t/ and voiced /d/, while in the surface forms, there is a contrast between [a] and [a:]. However, the analysis lacks any real explanatory force. It is true that there is a universal tendency for vowels to be longer before a voiced consonant than before a voiceless consonant (Kluender et al. 1988: 153). The rule for vowel lengthening before voiced consonants is thus justified, but the relationship between the two processes of vowel lengthening and consonant devoicing is not manifested clearly here (Baroni and Vanelli 2000: 28).

2.4 Moraic analyses

2.4.1 Vowel lengthening as mora insertion

Looking at the data of vowel lengthening from a diachronic perspective, it is possible to analyze the development of long vowels as resulting from mora insertion. Hualde (1990: 37-40) posits three main stages in the development of Friulian from Latin leading to the appearance of long vowels. First, there is voicing of intervocalic stops: [fi'nitu] > [fi'nidu] 'finished (m.)', [fi'nita] > [fi'nida] 'finished (f.)'. Next, non-low unstressed final vowels are lost: [fi'nidu] > [fi'nid], [fi'nida] - rule does not apply. Then,

stressed vowels followed by a word-final voiced obstruent lengthen: [fi'nid] > [fi'ni:d], [fi'nida] - rule does not apply because [d] is not word-final. Vowel lengthening here can be seen as a process of mora insertion based on two key generalizations – vowels in stressed syllables tend to be longer than vowels in unstressed syllables, and vowels in closed syllables tend to be longer before voiced consonants than before voiceless consonants (Hualde 1990: 38). "The two combined effects of primary stress and a following voiced consonant in the same rime can be seen as contributing an extra mora to the vowel" (Hualde 1990: 38). The extra mora then lengthens the vowel.

The final stage in the diachronic analysis entails the devoicing of word-final obstruents: [fi'ni:d] > [fi'ni:t], [fi'nida] - rule does not apply (Hualde 1990: 40). With the change of word-final [a] to [e], we obtain the current Friulian forms [fi'ni:t], [fi'nide] (Hualde 1990: 40). After final devoicing, vowel length becomes contrastive in the language. Following the diachronic analysis outlined above, we can say that the current contrast between long and short vowels arose from a historical process of mora insertion.

2.4.2 Vowel lengthening as compensatory lengthening

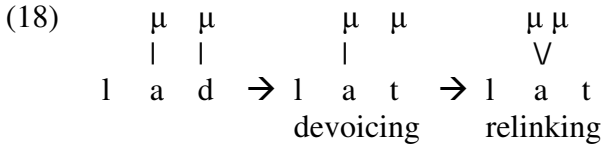
An alternative analysis presented in Hualde (1990) looks at the data from a synchronic point of view. This is quite justified, given several factors. For one, when vowel length alternations are consistently found in morphologically related items, vowel lengthening can be seen as a synchronic process still active in the language (Hualde 1990: 42). In Friulian, there are many alternations between long and short vowels in morphologically related forms, particularly between masculine and feminine items (Hualde 1990: 42). In addition, there is justification for a synchronic process of final

devoicing. Given alternations between morphologically related forms such as ['la:t] / ['lade] ‘gone (m.) / (f.)’, it makes sense to posit underlying [d] for both.

Further justification for a synchronic analysis of the Friulian data comes from treatment of Italian loanwords. Italian, unlike Friulian, has geminate consonants (and therefore distinctive consonantal length) and vowel lengthening in stressed open syllables. When Italian words enter Friulian, Friulian conserves the lengthened stressed vowels from Italian as phonologically long vowels in word-final position (Baroni and Vanelli 2000: 23). “Interestingly, when the new Friulian long vowels created in this way occur in word-internal position, they become short, but the obstruent following them is voiced” (Baroni and Vanelli 2000: 23). For example, Italian [impje'ga:to] ‘clerk (m.)’ becomes [impje'ga:t] / [impje'gade] ‘clerk (m.) / (f.)’. The treatment of loanwords provides strong evidence for the correlation between consonantal voice and vowel lengthening in speakers’ synchronic grammar. Any analysis of the data should therefore be able to account for the close relationship between these two characteristics of the language.

The second moraic analysis proposed by Hualde (1990) looks at the synchronic process of vowel lengthening in Friulian as a case of compensatory lengthening and mora preservation. He assumes that only voiced obstruents in a rime license a mora. The devoicing of a final consonant “set[s] its associated mora afloat” since voiceless segments cannot license a mora (Hualde 1990: 43). This mora is then linked to the preceding vowel, resulting in a bimoraic (long) vowel. The process is as follows:

(18)



This is clearly a case of mora preservation – in the input /lad/, there are two moras, one associated with the vowel, and one with the voiced obstruent /d/, and in the output [la:t] there are again two moras, though here they are both associated with the vowel.

This analysis has the advantage of capturing quite well the link between final devoicing and vowel lengthening in Friulian that we have seen to be quite strong. Final devoicing can now be seen as triggering vowel lengthening, with compensatory lengthening of the vowel compensating for the loss of voice of the final consonant.

2.5 Treatment of the liquids and rhotics

In section 2.1, we saw that stressed vowels are always long when they are followed by [r], and that before [l], both long and short stressed vowels can occur. The status of vowels before [r] does not seem to be problematic given that [r] is voiced and we expect vowel lengthening to occur before voiced word-final segments. However, we cannot posit the compensatory lengthening analysis to account for this – [r] is not devoiced because it is not an obstruent, so it does not lose a mora. In addition, it is unclear whether [r] would license a mora at all in Hualde's (1990) analysis. Rather, "lengthening in this case can … be taken as a low level rule" (Hualde 1990: 44). To account for this lengthening, we would need to add a rule to the derivational analysis in section 2.3. The rule for vowel lengthening as written precludes vowel lengthening before sonorants. A separate rule would need to be added accounting for lengthening before [r].

The liquids require a separate treatment to account for the behavior of vowels occurring before them. According to Repetti (1992), the contrast between long and short stressed vowels before [l] has been lexicalized. Vowels are short before an etymological geminate lateral such as *mīlle* > [mil] 'thousand', and long before an etymological single lateral such as *mĕle* > [mi:l] 'honey' (Repetti 1992: 163). See section 2.7 for further discussion of this issue.

2.6 OT Analysis

In this section, I will analyze the data from Friulian in OT. Given the arguments presented in section 2.4.2, we will look at vowel length before word-final obstruents as non-lexical (i.e. predicted by the grammar). Since vowel length is not lexical (except before /l/), there are no moras present in the input.

2.6.1 Vowel lengthening and final devoicing in OT

To account for vowel lengthening in OT, there are three relevant constraints. They are:

(19) WBP (Weight-by-Position) = voiced codas are moraic
μ-SHARE = within the rime, coda moras link to vowels
*V: = no long vowels

The ranking of these constraints that will predict the observed outputs is: WBP >> μ-SHARE >> *V:. An OT tableau for vowel lengthening in /lad/ is shown in (20). Note that in OT, vowel lengthening is accounted for by coda moras linking to the vowel as conditioned by μ-SHARE. There is no need for mora insertion in this account.

(20) Tableau for vowel lengthening in /lad/

	/lad/	WBP	μ-SHARE	*V:
a.	μ | l a d	*!		
b.	μ μ | | l a d		*!	
☞c.	μ μ | / | l a d			*

For final devoicing, there are two crucial constraints, shown in (21):

(21) *VCE CODA = codas are voiceless
IDENT-VCE = faithfulness to input voice

The ranking of these two constraints is: *VCE CODA >> IDENT-VCE. Combining the constraints in (19) and (21), we obtain the following tableau for /lad/ → [la:t].

(22) Tableau for [la:t]

	/lad/	WBP	μ-SHARE	*VCE CODA	*V:	IDENT-VCE
S	la:d_{μ}			*!	*	
O	☹ la:t				*!	*
F	lad	*		*		
T	☞ lat					*

In this tableau, the optimal candidate [la:t] loses to the transparent candidate [lat]. There is no way to reorder the constraints to allow the optimal candidate to win, given that it violates one more constraint than the transparent candidate does. We will thus have to look at ways to handle the opacity here[5].

[5] For a discussion of opacity in OT, see Kager (1999).

2.6.2 Handling the opacity in OT

There are several possible strategies to handle the opacity present in the case of Friulian. One possible strategy involves the use of local conjunction (Smolensky 1993: 8). However, this is a case of counterbleeding, so local conjunction will not be able to handle the opacity. The optimal candidate, not the transparent candidate, violates two constraints. The transparent candidate violates fewer constraints than the optimal candidate, so conjoining constraints will not help us. A second possible remedy is output-to-output correspondence. OO-correspondence favors the maximization of phonological identity between morphologically related output forms (Kager 1999: 257). In the case of ['la:t] / ['lade], there is no phonological identity between the two forms, even though they are morphologically related. OO-correspondence cannot handle this opacity either then.

One remedy that typically works in cases of counterbleeding is sympathy (McCarthy 1999: 358). Looking at the ☹ tableau in (22), we can identify the selector constraint as IDENT-VCE. The sympathetic candidate is [la:d], since it is the best of the forms that are faithful to the voice of [d]. The sympathy constraint is:

(23) ❀-MAX-μ = each mora of ❀-candidate must have correspondent in the output

Adding the sympathy constraint just to the left of *V:, we obtain the following tableau.

(24) Sympathy tableau

	/lad/	WBP	μ-SHARE	*VCE CODA	❀-MAX-μ	*V:	★IDENT-VCE
S	$la:d_{\mu}$			*!		*	
O	☞ la:t					*	*
F	lad	*!		*	*		
T	lat				*!		*

The sympathy approach handles the opacity well, allowing the optimal candidate [la:t], with vowel lengthening and final devoicing to win. The transparent candidate now violates higher ranked ❁-MAX-μ, eliminating it from consideration.

One final approach that is successful in resolving the opacity is using stratal OT (Kiparsky 1997). We will need two tableaux – one which allows vowel lengthening and one in which devoicing and faithfulness to the length of the vowel are favored. The ranking of constraints will differ in each tableau to enable these different types of outputs at each stage. We will also need a new constraint for the second tableau to account for faithfulness to long vowels:

(25) MAX-μ-IO = each mora of input must have a correspondent in the output

We end up with the following two tableaux:

(26) Tableau 1

	/lad/	WBP	μ-SHARE	IDENT-VCE	MAX-μ-IO	*V:	*VCE CODA
☞a.	$la:d_{\mu}$					*	*
b.	la:t			*!		*	
c.	lad	*!					*
d.	lat			*!			

Tableau 2

	/$la:d_{\mu}$/	WBP	μ-SHARE	*VCE CODA	MAX-μ-IO	*V:	IDENT-VCE
a.	$la:d_{\mu}$			*!		*	
☞b.	la:t					*	*
c.	lad	*!		*			
d.	lat				*!		*

Having two different strata and reversing the position of IDENT-VCE and *VCE CODA in the constraint ranking resolves the opacity and allows the optimal candidate [la:t] to win. We can therefore say that the opacity of the interaction between vowel lengthening and final devoicing in Friulian can be handled in OT through the sympathy approach or by using stratal OT.

2.7 An alternative analysis

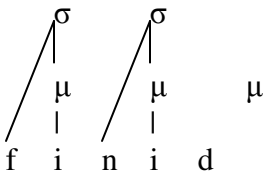
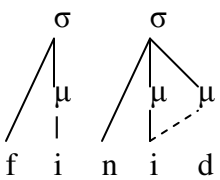
Though there is a considerable amount of evidence for considering vowel lengthening and final consonant devoicing to be two intricately related synchronic processes in Friulian (see section 2.4.2), there are some problems with this analysis. First, it requires that we posit that only voiced segments may license a mora in coda position. This accounts for compensatory vowel lengthening following the loss of consonant voice in final position in the case of /lad/ → [la:t], for example. However, it is not clear how the lack of vowel lengthening before nasals, such as in [maŋ] 'hand' should be handled. Nasals are voiced, and are more sonorous than voiced obstruents. Why then should they not license a mora in coda position? One possible solution is to say that a historical process of vowel lengthening came to be reinterpreted as a synchronic process related to consonant voice.

Repetti (1989) makes an important observation about the distribution of long vowels in Friulian. She states that "the only vowels which acquire length in Friulian originate in Latin paroxytones with open tonic syllables, which, significantly, have undergone apocope" (Repetti 1989: 106). Lengthening in this context is attributed to the

loss of all word-final vowels except [a], thus it is considered to be a case of compensatory lengthening.

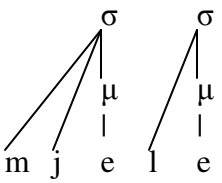
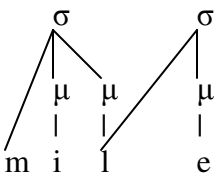
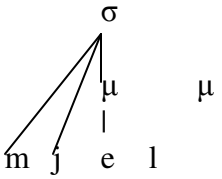
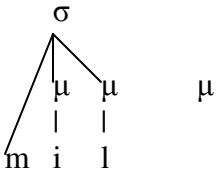
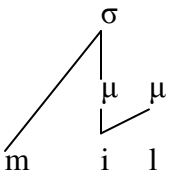
Prieto-Vives (1994) expands on Repetti's analysis, illustrating the process which led historically to vowel lengthening. Three key steps are posited to result in observed surface forms (Prieto-Vives 1994: 179). First, there is deletion of final vowels except [a] and parasitic delinking. Then, there is compensatory lengthening of the vowel. Lastly, final consonants are devoiced. This account of compensatory lengthening is slightly different than that of Hualde in section 2.4.2. Here, vowel length results from loss of the final vowel, not from loss of consonant voice. The evolution of [fini:t] and [finide] can be represented schematically as in (27) (from Prieto-Vives 1994: 179).

(27)

Classical Latin forms	FINITU	FINITA
Late Latin forms	finidu	finida
Final deletion and Parasitic delinking		n/a
Compensatory lengthening		n/a
Final devoicing	t	n/a
Surface forms	[fini:t]	[finide]

It is crucial that the tonic syllable be open at the time of apocope in order for vowel lengthening to take place. Vowel lengthening fails to occur when the tonic syllable is closed before final vowel deletion. A tonic vowel in a closed syllable cannot link to an abandoned final mora because "the association line linking segmental and prosodic material would be crossed" (Prieto-Vives 1994: 179). The evolution in [mi:l] 'honey' and [mil] 'thousand' illustrates this contrast.

(28) [mi:l] / [mil] (Prieto-Vives 1994: 182)

Classical Latin forms	MELE 'honey'	MILLE 'thousand'
Late Latin forms	mjele	mille
Morification		
Vowel deletion and Parasitic delinking		
Compensatory Lengthening and Vowel change		n/a
Surface forms	[mi:l]	[mil]

Looking at (28), it is clear why vowels in closed syllables prior to final vowel deletion cannot link to the stranded mora. The [l] in *mille* is geminate and is therefore linked to both the first and last syllables of the word. When the final [e] is lost, [i] cannot

lengthen because [l] is still linked to structure. Association lines cannot be crossed. The [e] in *mjele* is free to lengthen as no association lines are present.

Prieto-Vives' (1994) analysis is also able to account for the lack of compensatory vowel lengthening before nasals and the consistent vowel lengthening before [r]. It has been claimed that vowel lengthening before nasals was blocked by nasalization (Repetti 1989: 109). Syllables in Early Friulian were maximally bimoraic (Prieto-Vives 1994: 180). Prieto-Vives (1994) claims that it is possible that phonetic nasalization of vowels has some influence on moraic count. If nasalization counts for two moras (as it does in Tavetsch[6], for example), a syllable containing a nasalized vowel will already be bimoraic and will therefore be unable to link to a stranded mora following final vowel deletion (Prieto-Vives 1994: 183). To account for vowel lengthening before [r], regardless of whether it was geminate or not, a "late lengthening effect caused by word-final [r]" is posited (Prieto-Vives 1994: 184). Alternatively, Hualde (1990:40) has proposed that final [rr] simplified to [r] before elimination of other geminates. This could also account for why vowels always lengthen before [r].

This historical analysis accounts very well for the Friulian data. However, we cannot deny the importance of vowel lengthening as a synchronic process in the language. Facts from studies on loanwords, for example, (see section 2.4.2) provide strong evidence for a synchronic analysis. Prieto-Vives (1994: 187) points out that when looking at alternations such as [fini:t]/[finide]:

[6] Tavetsch is a Rhaeto-Romance dialect spoken in the Tavetsch Valley, located in the westernmost part of the Canton des Grisons in Switzerland.

> … there is no evidence for the speaker of Modern Friulian (following Kiparsky's Alternation Condition) that an abstract vowel can delete and compensate the preceding tonic vowel; today's alternations provide the speaker with another interpretation of the data, mainly based on the voicing properties of the final consonant, for which the speaker has some empirical evidence.

Thus, even if vowel lengthening originated as compensatory lengthening following final vowel deletion, it seems it has been reinterpreted as lengthening due to the voice of a following consonant (see sections 2.4 and 2.6) in speakers' synchronic grammar.

3. Milanese

Synchronically, vowel lengthening in Milanese is a process that is quite different from that of Friulian in terms of its motivation for occurring in the language. In this chapter, we will explore the motivations for vowel lengthening in Milanese.

3.1 Distribution of long vowels (Prieto i Vives 2000: 258-261)

As in Friulian, long vowels in Milanese occur only in stressed word-final syllables. Vowels in word-final stressed position are long before (underlyingly) voiced obstruents and short before voiceless obstruents. Before final /l/, vowels can be short or long, as in ['pe:l] 'hair' versus ['pɛl] 'skin'. Final /n/ can be preceded by a short vowel or by a long nasalized vowel, in which case the nasal consonant is deleted: ['pan] 'cloth', ['pã:] 'bread'. Vowels are always long before word-final /r/. Before word-final consonant clusters, vowels can be short or long – in general, vowels tend to be long before liquid + obstruent clusters and short before voiceless clusters.

3.2 Vowel length and final devoicing

In Milanese, unlike in Friulian, final obstruent devoicing is optional: ['nœ:v] ~ ['nœ:f] 'new(m.)' (Prieto i Vives 2000: 258). There is no issue of opacity when final devoicing fails to apply. Vowels lengthen before voiced obstruents as expected, given such a rule of vowel lengthening. For Milanese then, one could posit the same rules introduced in section 2.3 for Friulian to account for vowel lengthening before voiced obstruents, reproduced below in (29).

(29) Rules:

1. Vowel lengthening V → V: / __ C ##
   [+ voice]
   [-son]

2. Final devoicing C → [-voice] / __ ## (optional)
   [-son]

The optionality of final devoicing and the concurrence of forms such as ['nœ:v] ~ ['nœ:f] indicate that we must analyze Milanese differently than Friulian. In section 2.4.2, we analyzed vowel lengthening in Friulian as compensatory lengthening, conserving the mora associated with a previously voiced obstruent. For Milanese, we cannot analyze long vowels as resulting from compensatory lengthening due to loss of consonant voice because there are forms that maintain the voice of the consonant and still have long vowels, such as ['nœ:v].

3.3 Optimization at the level of the foot

Prieto i Vives (2000) claims that the motivation for vowel lengthening in Milanese can be found in the desire for well-formedness at the foot level. Bimoraic feet are optimal, and monomoraic feet tend to be repaired (Prieto i Vives 2000: 266). Repair consists of adding a mora, either to the final consonant, or to the vowel, lengthening it. Thus, there are two possible structures for underlyingly monomoraic /nœv/ and /myf/ 'moldy (m.)' that result in a bimoraic foot (Prieto i Vives 2000: 267):

(30)

μ μ		μ μ		μ μ		μ μ
∨		| |		∨		| |
n œ: v	and	n œ v		m y: f	and	m y f

For /nœv/, the first structure is selected, while for /myf/, the second structure is the optimal one. In order to account for this difference, Prieto i Vives claims that voiced word-final consonants contribute an underlying mora to the structure. This mora is then parsed into the structure. The mora is linked to the vowel in the resulting structure of ['nœ:v] in order to create a nucleus with a higher sonority (Prieto i Vives 2000: 267-268). In the case of /myf/, voiceless /f/ does not contribute a mora to the underlying structure. Thus, there is no source for vowel lengthening (Prieto i Vives 2000: 269). Instead, a mora is assigned to the coda consonant.

This analysis does not account very clearly for the data. While the notion of optimizing foot structure as a motivation for vowel lengthening is desirable, the repair strategies proposed for monomoraic feet are not coherent. Prieto i Vives speaks of wanting to create a nucleus with a higher sonority as being motivation for the mora projected by the /v/ in /nœv/ to be subsequently linked to the vowel. When a mora is inserted for /myf/, however, it is not clear why it does not add to the vowel as well. If there is a desire to create a more sonorous nucleus, it seems there would be a tendency for the vowel to lengthen also in this case. Instead, the mora is assigned to /f/. This inconsistency is not well accounted for by Prieto i Vives.

In an earlier analysis, Prieto-Vives (1994) proposes a slightly different foot structure. While in Prieto i Vives (2000) final consonants are parsed into the foot, in Prieto-Vives (1994), final consonants are extrametrical. Prieto-Vives (1994: 211) claims that all word-final consonants are extrametrical and that some syllables are lexically marked as extrametrical (for example, in words with antepenultimate stress such as

['pegura] 'sheep'). However, voiced final consonants can still contribute moras to the structure. This is the source of vowel lengthening before voiced final consonants. So in this analysis, there is no lengthening in /myf/ because voiceless /f/ does not project a mora, so the vowel cannot lengthen. "Monomoraic Foot Expansion" only occurs when a mora is available in the representation and the vowel spreads to fill that mora (Prieto-Vives 1994: 210).

Prieto-Vives' earlier analysis is somewhat more coherent, but it contradicts her later analysis of vowel lengthening in Milanese as resulting from a desire for foot binarity. In addition, the notion of final voiced consonants contributing moras to foot structure while being extrametrical is a bit abstract. Not only that, but it is unclear why only voiced extrametrical segments may project a mora. Milanese has a trochaic stress system, with stress falling on one of the last three syllables of the word (Prieto-Vives 1994: 209). Typically, antepenultimate stress is only possible when the penultimate syllable is light (Prieto-Vives 1994: 209). Thus, "stress in Milanese is weight sensitive and does not make a distinction between voiced and voiceless consonants in penultimate positions; all rime consonants in penultimate positions, then, will license a mora" (Prieto-Vives 1994: 212). It is unclear why both voiced and voiceless segments in coda position word-internally license a mora, but word-finally only voiced consonants can project a mora.

3.4 Historical analyses

Before considering a second synchronic analysis, we will consider some historical analyses of the Milanese data.

3.4.1 Vowel lengthening as compensatory lengthening

Repetti (1989: 126) notes that in Milanese, as in Friulian, "we do not find long vowels in unapocopated words, even in open syllables." There is thus an important similarity in the historical source of vowel lengthening in the two dialects. In Milanese, we could propose an analysis of vowel lengthening as resulting from compensatory lengthening due to apocope of final vowels, as we did for Friulian in section 2.7. Repetti (1989: 129) proposes the following historical development of Classical Latin *dĭgitu* 'finger', *nŏvu* 'new', *căttu* 'cat', and **gŭbbu* 'hunchback':

(31)

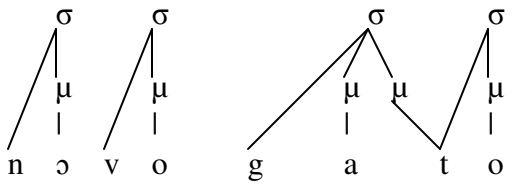
Classical Latin	DĬ(GI)TU	NŎVU	CĂTTU	*GŬBBU
Late Latin	dito	nɔvo	gatto	gobbo
intervocalic voicing	dido	----	----	-----
apocope/compensatory lengthening	di:d	nɔ:v	gatt	gobb
degemination	----	----	gat	gob
devoicing in final position (optional)	(di:t)	(nɔ:f)	----	(gop)
observed forms	di:d / di:t	nö:v / nö:f	gat	göb / göp

It is clear that vowel lengthening historically occurs in Milanese to compensate for the loss of the final vowel. When the final vowel is deleted, its mora is stranded. The preceding vowel rescues the stranded mora, lengthening. However, if the preceding vowel is in a closed syllable, the vowel cannot attach to the stranded mora. Crucially,

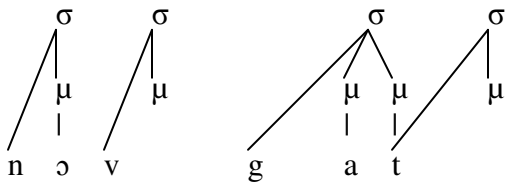
apocope occurs before degemination. See for example the development of [nö:v] / [nö:f][7] 'new', compared to that of [gat] 'cat' from Repetti (1992: 176-177):

(32) *nŏvu* > *[nɔvo] > [nö:v] / [nö:f] 'new' and *căttu* > *[gat:o] > [gat] 'cat

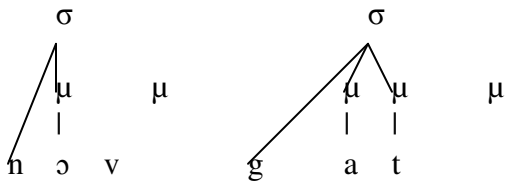
a. input form



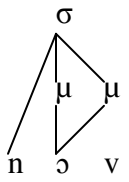
b. apocope



c. parasitic delinking

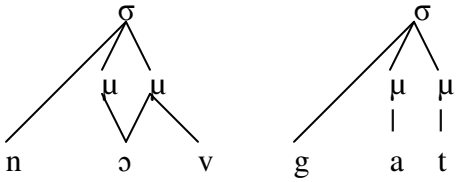


d. compensatory lengthening



n/a

e. surface form



Vowel lengthening cannot occur in [gat] because the formerly geminate [t] is still linked to structure and association lines cannot be crossed. Thus, the mora is lost. In

[7] There is a discrepancy in the quality of the vowel in the Milanese word for 'new'. Prieto i Vives (2000) transcribes the vowel as [œ], while Repetti (1989, 1992) uses [ö]. Since I am not concerned with vowel quality in this report, I have chosen to use the transcription provided by each source when citing their work.

[nö:v], however, the [v], previously in onset position, is not linked to structure. The vowel is then free to spread to the stranded mora and compensatory lengthening occurs. According to this historical account of lengthening in Milanese, long vowels occur due to compensatory lengthening following the loss of word-final vowels. It is interesting to note that, looking at the synchronic data, we can see how the pattern observed in section 3.1 emerges: vowels are long before word-final voiced obstruents and short before voiceless obstruents. However, [göb] / [göp] presents a problem for this generalization. Here, we have a voiced word-final obstruent preceded by a short vowel. This tells us that the derivational analysis in section 3.2 cannot adequately account for the Milanese data. The historical analysis presented in this section, on the other hand, does account well for the contrast between short and long vowels.

3.4.2 Moraic versus non-moraic codas

Looking again at the case of [göb] / [göp] versus [nö:v] / [nö:f], an important generalization emerges. We saw in the previous section that a rule lengthening vowels before word-final voiced consonants is not sufficient to describe Milanese vowel length. The historical analysis looking at compensatory vowel lengthening accounts better for the data, but from this analysis, we can make an additional observation. Compensatory vowel lengthening was blocked in the case of [göb] / [göp] because the syllable containing the vowel was closed by the geminate [b] at the time of apocope of word-final vowels. Montreuil (1991: 44) insists that the historical development of Milanese has led to the creation of a lexical moraic versus non-moraic coda contrast. Looking at the surface forms in (32) of [gat] and [nö:v] / [nö:f], we can see in fact that the [v] of [nö:v] does not

license a mora of its own – it is linked to the mora of the preceding vowel – while the [t] in [gat] does project a mora (as would the [b] of [göb]).

Moraic codas are derived from historical geminates or final C+C combinations. A final consonant followed by another consonant was historically in coda position, and thus had a mora associated to it. This mora has been preserved in the current language. Non-moraic codas are derived from final C (single consonants) (Montreuil 1991: 44). A final single consonant, historically followed by a vowel, never had a mora associated with it – it was in onset position. So, these consonants do not license a mora. These historical onsets (currently non-moraic codas) are voiced due to the process of voicing of intervocalic obstruents that occurred before apocope of final vowels (see (31)). On the surface then, we see long vowels before voiced codas, similar to what we saw in underlying forms in Friulian.

In the next section, we will see how the contrast between moraic and non-moraic codas interacts with vowel length in synchronic Milanese. In this account of vowel lengthening, long vowels result from a synchronic process, not a diachronic process as Repetti (1989) posits (see section 3.4.1).

3.5 Optimization at the level of the syllable

Rather than looking at foot formation like Prieto i Vives, Montreuil (1991) focuses on the notion of stressed syllable well-formedness. Bimoraic enforcement, the principle requiring that all stressed syllables be bimoraic (see section 1.2.2 for bimoraic enforcement in Italian), is active in Milanese (Montreuil 1991: 44). Another important

property of Milanese is the moraic status of codas that we explored in the previous section.

Bimoraic enforcement plays a crucial role in determining vowel length in synchronic Milanese, particularly regarding its interaction with moraic and non-moraic codas. When stress is borne by a word-final syllable, bimoraic enforcement ensures that this syllable is bimoraic. All forms with word-final moraic codas will be bimoraic in the underlying form (one mora from the vowel + one mora from the coda consonant), and thus are not subject to bimoraic enforcement. Forms with word-final non-moraic codas will be monomoraic in the input, having only the mora from the vowel. They will therefore be subject to bimoraic enforcement. To satisfy bimoraicity, a mora must be inserted. This can be achieved in two ways – by adding a mora to the vowel or by adding a mora to the consonant (Montreuil 1991: 44). However, adding a mora to the consonant destroys the lexical moraic versus non-moraic coda contrast (Montreuil 1991: 44). In Milanese, it is therefore preferable to add the mora to the vowel, creating a long vowel.

The underlying forms for [fys] *fuss* 'pits' with a moraic coda (i.e. an etymological coda) and [fy:z] *fus* 'spindle' with a non-moraic coda (i.e. an etymological onset) are as follows (from Montreuil 1991: 43):

(33) /fys/ μ μ /fyz/ μ
| | |\
f y s f y z

It is important to note that in the underlying form of /fyz/, /z/ links to the mora of the vowel. It is unable to license a mora on its own. After the application of bimoraic enforcement, which lengthens the vowel in /fyz/, we obtain the surface forms:

(34) [fys] μ μ [fy:z] μ μ
| | \/\
f y s f y z

One critique of the notion of bimoraic enforcement in Milanese is presented by Prieto-Vives (1994). She claims that Montreuil's analysis incorrectly predicts that vowels in open stressed syllables should be long (Prieto-Vives 1994: 191). According to the generalizations we have seen thus far, i.e. that long vowels occur only in stressed word final syllables, Prieto-Vives' critique is justified. However, Montreuil (1991: 38) says that "only stressed vowels" in Milanese can be long. He does not restrict those long stressed vowels to word-final syllables. Nicoli (1983: 50) cites several examples of words with long vowels that are stressed but not in word-final syllables: *géra* ['ʤe:ra] 'gravel', *scirésa* [ʃi're:za] 'cherry', *tôza* ['tu:za] 'girl', *spésa* ['spe:za] 'shopping'. The notion of bimoraic enforcement in Milanese can account for these forms. Repetti's (1989) historical analysis (see section 3.4.1) cannot account for them. Forms with long vowels in open syllables where there was no apocope, such as in ['tu:za] 'girl', are problematic for her analysis of vowel length in Milanese as resulting from compensatory lengthening.

Judging then from the data presented thus far, it seems that the best way to account for vowel lengthening in Milanese is to say that it is the result of bimoraic enforcement.

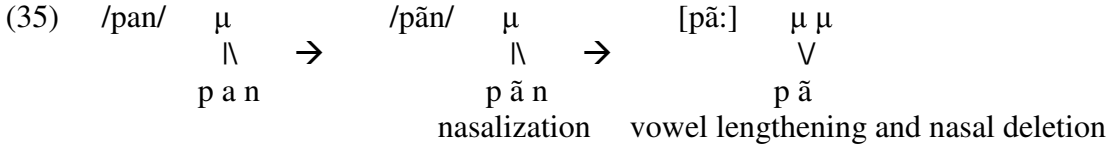
3.5.1 Treatment of vowels before /l/ and /n/

As we saw in section 3.1, stressed vowels can be short or long before word-final /l/ or /n/. The analysis above regarding optimization of stressed syllable structure can

account for this alternation. As with all stressed syllables in Milanese, there is a desire for stressed syllables closed with /l/ or /n/ to be bimoraic. Whether or not there is vowel lengthening is again dependent on the moraic status of the coda consonant. Before word-final moraic /l/ or /n/, no lengthening of a stressed vowel occurs. These items are bimoraic in the underlying form (see [fys] above). Before non-moraic /l/ or /n/ there is vowel lengthening of the stressed vowel to satisfy the desire for bimoraicity. The distinction between moraic and non-moraic /l/ and /n/ arises from a contrast between historical onset /l/ and /n/ (now non-moraic codas) and historical coda or geminate /l/ and /n/ (now moraic codas). We therefore see a contrast in forms such as [pe:l] 'hair' (from Latin *pilus*), with a non-moraic coda [l] and vowel lengthening and [pɛl] 'skin' (from Latin *pellis*), with a moraic coda [l] and no vowel-lengthening.

The analysis above has the additional benefit of accounting well for nasalization in items such as [pã:] 'bread'. Given the underlying form /pan/ with non-moraic coda /n/ (from Latin *panis*), we could posit a rule that reads "*nasalize inside the mora*", followed by enforcement of bimoraicity and a rule of nasal deletion to generate the surface form [pã:] (Montreuil 1991: 45).

(35)



Nasalization does not occur before a moraic coda /n/. A word such as [pan] 'cloth', with moraic coda /n/ (from Latin *pannus* where the /n/ was geminate), is bimoraic in the

underlying representation (see (36)). The vowel and /n/ do not share a mora, thus nasalization does not take place.

(36) /pan$_{\mu}$/

```
      μ  μ
      |  |
   p  a  n
```

3.5.2 OT Analysis

In this section, I will propose an OT analysis of vowel lengthening in synchronic Milanese. Note that the inputs will contain the moraic versus non-moraic coda contrast. Relevant constraints are in (37).

(37) STW = if stressed, then heavy (bimoraic)
MAX-μ = each mora of input must have a correspondent in the output
*μ-SHARE = no linking of coda moras to vowels within the rime
DEP-μ-V = output moras on vowels must have input correspondents
DEP-μ-C = output moras on consonants must have input correspondents

The constraint STW will be ranked highly to ensure that stressed syllables are bimoraic. The tableaux for [fys] 'pits' and [fy:z] 'spindle' are as follows:

(38) [fys]

	μ μ | | /f y s/	STW	*μ-SHARE	MAX-μ	DEP-μ-C	DEP-μ-V
☞a.	μ μ | | f y s					
b.	μ μ | / | f y s		*!			
c.	μ μ \/ f y s		*!			
d.	μ | f y s	*!		*		

(39) [fy:z]

	μ |\ /f y z/	STW	*μ-SHARE	MAX-μ	DEP-μ-C	DEP-μ-V
a.	μ μ | | f y z				*!	
b.	μ μ |/| f y z		*!		*	
☞c.	μ μ \/ f y z					*
d.	μ |\ f y z	*!	*			

The crucial ranking of DEP-μ-C over DEP-μ-V enables [fy:z] with a long vowel to win in tableau (39). This captures the desire in Milanese to remedy monomoraic stressed syllables by lengthening the vowel rather than assigning a mora to the coda consonant.

4. Conclusions

In this report, we have explored the phenomenon of vowel lengthening in Standard Italian, Friulian, and Milanese. For Standard Italian, we found that the bimoraic norm applies, which requires that all stressed vowels in open syllables be long. This accounts for the fact that all stressed syllables in Italian are bimoraic – either with a long vowel or a short vowel followed by a coda consonant. A constraint preventing long vowels in word-final syllables is active in Italian, preventing the realization of long vowels in that position.

Vowel length in Friulian and Milanese was seen to have somewhat different motivation for occurring than in Italian. In Friulian, long vowels developed historically from compensatory lengthening following apocope of word-final vowels. This historical process has been reinterpreted as a synchronic process where vowel lengthening is seen to occur to compensate for the loss of voice of final consonants. Vowel lengthening appears synchronically to occur before underlyingly voiced word-final obstruents.

In Milanese, vowel lengthening occurs frequently before underlyingly voiced segments as well, but for different reasons. Since final devoicing is optional in Milanese, vowel lengthening cannot be analyzed as compensatory lengthening due to loss of consonant voice. Instead, we analyzed vowel lengthening as the result of bimoraic enforcement applying, responding to a lexical moraic versus non-moraic coda contrast.

We can say that vowel lengthening occurs in both Milanese and Italian due to a desire for bimoraic stressed syllables. Lengthening in Milanese and Friulian can both be accounted for by considering the historical development of long vowels, but

synchronically, the two dialects diverge in how vowel length can be accounted for. These differences contribute to the linguistic diversity and richness present in Italo-Romance.

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